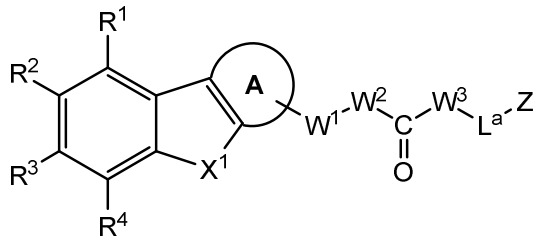
CLAIMS

1. A compound of formula (I):



(I)

or a pharmaceutically acceptable salt thereof, wherein:

R^1, R^2, R^3, and R^4 are each independently selected from hydrogen, C_1-C_6 alkoxy, halo, and C_1-C_6 alkyl;

X^1 is selected from S and NH;

A is selected from a five- or six-membered cycloalkyl, heterocyclyl, heteroaryl, or aryl, each of which is optionally substituted with 1 or 2 oxo groups;

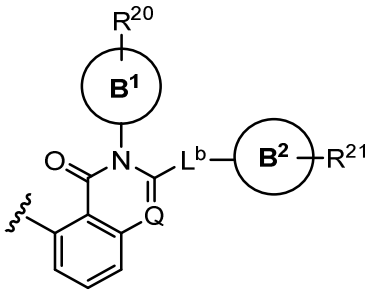
W^1 is a bond or O;

W^2 is selected from C_1-C_6 alkylene, C_3-C_6 cycloalkylene, C_3-C_6 cycloalkylene-C_1-C_6 alkylene, arylene, and hydroxy-C_1-C_6-alkylene;

W^3 is O or NH;

L^a is a linker; and

Z is



wherein:

Q is CH or N;

B^1 is aryl or a 5- or 6-membered monocyclic heteroaryl having 1, 2, 3, or 4 heteroatoms independently selected from N, O, S, and P;

R^{20} is selected from hydrogen, halo, C_1-C_4 alkyl, C_3-C_6 cycloalkyl, C_1-C_4 haloalkyl, $-OR^{a1}$, $-N(R^{a2})(R^{a3})$, $-SO_2R^{a4}$, $-SO_2N(R^{a5})(R^{a6})$, and $-NHSO_2R^{a7}$, wherein R^{a1}, R^{a2}, R^{a3}, R^{a4}, R^{a5}, R^{a6}, and R^{a7} are each independently selected from hydrogen, C_1-C_4 alkyl, and C_1-C_4 haloalkyl;

R^{21} is selected from hydrogen and a group $-L^{21}$-E, wherein:

L^{21} is a bond, C_1-C_2 alkylene, -CH=CH-, -C≡C-, -C(O)-, -O-, -NH-, -S-, -C(O)O-, -C(O)NH-, -C(O)S-, arylene, cycloalkylene, heteroarylene, or heterocyclylene, or wherein L^{21} comprises a combination of any two of such groups;

E is a bicyclic heterocyclyl or bicyclic heteroaryl, each of which is optionally substituted with 1, 2, 3, 4, or 5 substituents independently selected from halo, C_1-C_4 alkyl, C_3-C_6 cycloalkyl, C_3-C_6-cycloalkyl-C_1-$_4$-alkyl, C_1-C_4 haloalkyl, oxo, $-OR^{b1}$, $-N(R^{b2})(R^{b3})$, $-SO_2R^{b4}$, $-SO_2N(R^{b5})(R^{b6})$, and $-NHSO_2R^{b7}$, wherein R^{b1}, R^{b2}, R^{b3}, R^{b4}, R^{b5}, R^{b6}, and R^{b7} are each independently selected from hydrogen, C_1-C_4 alkyl, and C_1-C_4 haloalkyl;

L^b is $–(CR^{c1}R^{c2})_m$-G^b–, wherein:

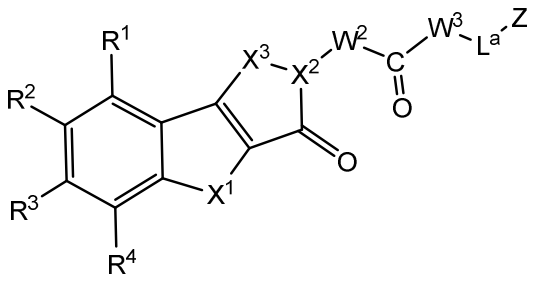
R^{c1} and R^{c2} are independently selected from hydrogen and C_1-C_4 alkyl;

m is 0, 1, or 2; and

G^b is a bond, -NHC(O)-, -NH-, -O-, or -S-; and

B^2 is a bicyclic heteroaryl or bicyclic heterocyclyl, each of which is optionally substituted with 1, 2, 3, 4, or 5 substituents independently selected from halo, C_1-C_4 alkyl, C_3-C_6 cycloalkyl, C_1-C_4 haloalkyl, optionally substituted aryl, $-OR^{d1}$, $-N(R^{d2})(R^{d3})$, $-SO_2R^{d4}$, $-SO_2N(R^{d5})(R^{d6})$, and $-NHSO_2R^{d7}$, wherein R^{d1}, R^{d2}, R^{d3}, R^{d4}, R^{d5}, R^{d6}, and R^{d7} are each independently selected from hydrogen, C_1-C_4 alkyl, and C_1-C_4 haloalkyl.

2. The compound of claim 1, wherein the compound is a compound of formula (Ia):



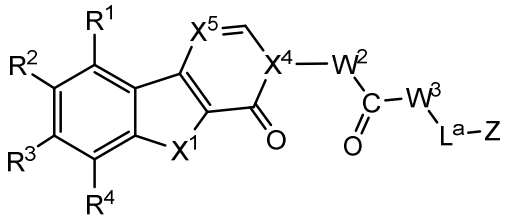
(Ia)

or a pharmaceutically acceptable salt thereof, wherein X^2 is CH or N, and X^3 is CH_2 or CO.

3. The compound of claim 2, or a pharmaceutically acceptable salt thereof, wherein X^2 is N.

4. The compound of claim 2 or 3, or a pharmaceutically acceptable salt thereof, wherein X^3 is CO.

5. The compound of claim 1, wherein the compound is a compound of formula (Ib):



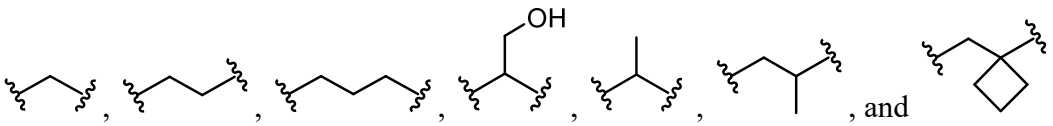
(Ib)

or a pharmaceutically acceptable salt thereof, wherein X^4 and X^5 are independently selected from N and CH.

6. The compound of claim 5, or a pharmaceutically acceptable salt thereof, wherein X^4 and X^5 are N.

7. The compound of any of claims 1-6, or a pharmaceutically acceptable salt thereof, wherein X^1 is S.

8. The compound of any of claims 1-7, or a pharmaceutically acceptable salt thereof, wherein W^2 is selected from:



9. The compound of any of claims 1-8, or a pharmaceutically acceptable salt thereof, wherein W^3 is O.

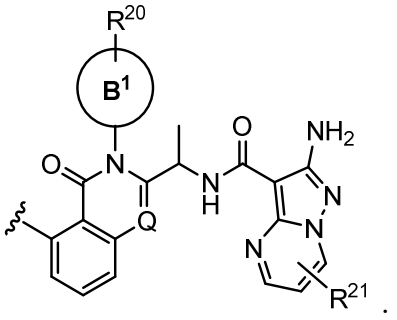
10. The compound of any of claims 1-9, or a pharmaceutically acceptable salt thereof, wherein R^2 and R^3 are each independently C_1-C_6 alkoxy.

11. The compound of claim 10, or a pharmaceutically acceptable salt thereof, wherein R^2 and R^3 are each methoxy.

12. The compound of any of claims 1-11, or a pharmaceutically acceptable salt thereof, wherein R^1 and R^4 are each independently halo or hydrogen.

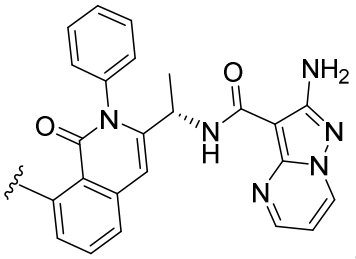
13. The compound of any of claims 1-12, or a pharmaceutically acceptable salt thereof, wherein R^1 and R^4 are hydrogen, and R^2 and R^3 are methoxy.

14. The compound of any one of claims 1-13, or a pharmaceutically acceptable salt thereof, wherein Z is:



15. The compound of claim 14, or a pharmaceutically acceptable salt thereof, wherein B^1 is phenyl.

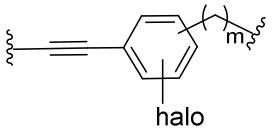
16. The compound of claims 14 or 15, or a pharmaceutically acceptable salt thereof, wherein Z is:



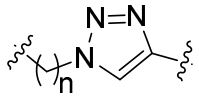
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17. The compound of any one of claims 1-16, or a pharmaceutically acceptable salt thereof, wherein L^a comprises one or more groups independently selected from -C(R')$_2$-, -CH=CH-, -C≡C-, -O-, -NR'-, -BR'-, -S-, -C(O)-, -C(NR')-, -S(O)-, -S(O)$_2$-, arylene, heteroarylene, cycloalkylene, and heterocyclylene, wherein each R' is independently selected from hydrogen, C_1-C_{80} alkyl, C_2-C_{80} alkenyl, C_2-C_{80} alkynyl, aryl, arylalkyl, cycloalkyl, cycloalkylalkyl, heterocyclyl, heterocyclylalkyl, heteroaryl, and heteroarylalkyl, and wherein each alkyl, arylene, heteroarylene, cycloalkylene, and heterocyclylene is independently unsubstituted or substituted with 1, 2, or 3 substituents.

18. The compound of claim 17, or a pharmaceutically acceptable salt thereof, wherein L^a is

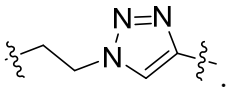


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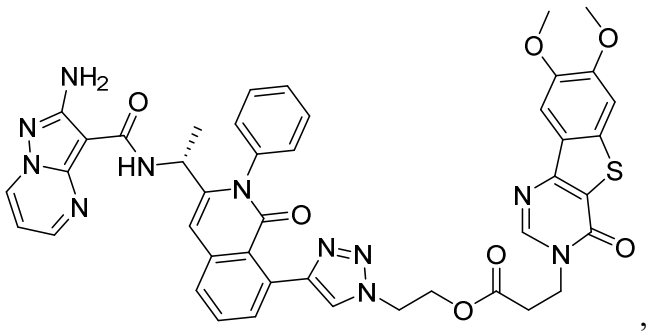
, wherein m and n are independently 1, 2, 3, 4, or 5.

19. The compound of claim 18, or a pharmaceutically acceptable salt thereof, wherein L^a is

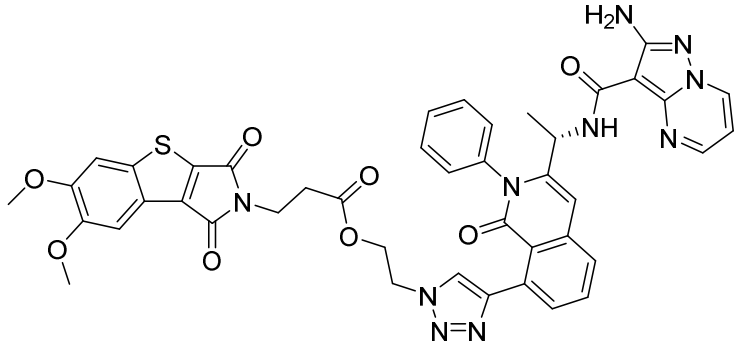


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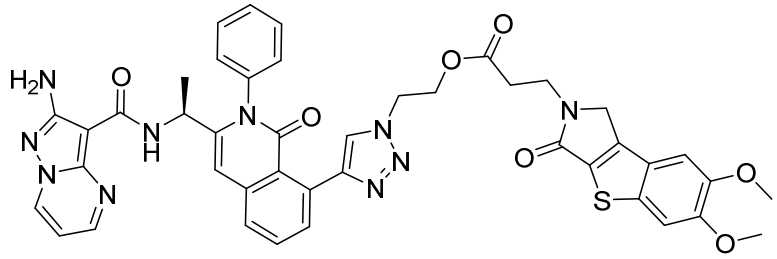
20. The compound of claim 1, wherein the compound is selected from:



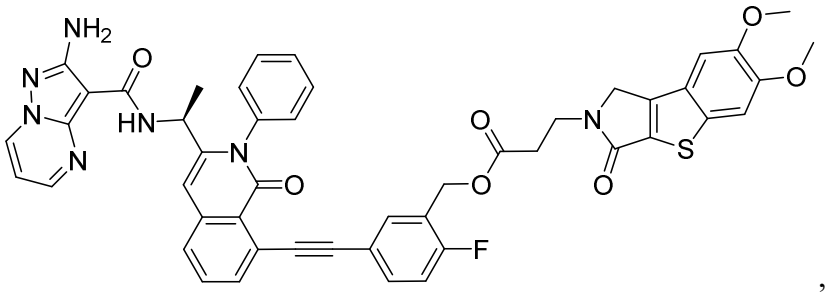
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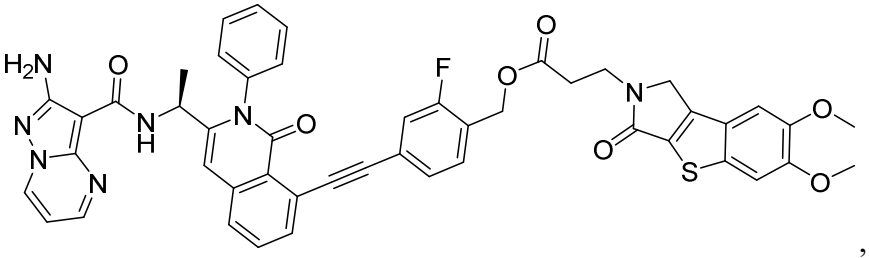
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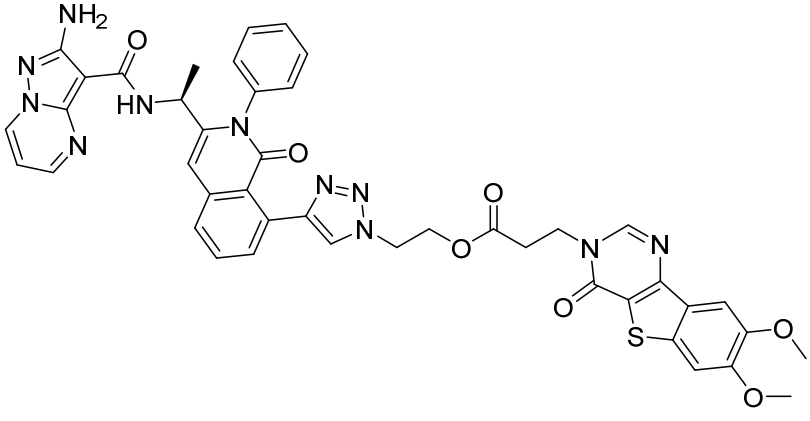
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and pharmaceutically acceptable salts thereof.

21. A pharmaceutical composition comprising an effective amount of a compound of any one of claims 1-20, or a pharmaceutically acceptable salt thereof, and a pharmaceutically acceptable carrier.

22. The pharmaceutical composition of claim 21, wherein the composition comprises albumin nanoparticles, liposomes, micelles, or lipid nanoparticles.

23. A vaccine comprising an effective amount of:

a compound of any one of claims 1-20, or a pharmaceutically acceptable salt thereof, or a composition of claim 21 or 22; and

an antigen or a nucleic acid encoding thereof.

24. A compound of any one of claims 1-20, or a pharmaceutically acceptable salt thereof, or a composition of claim 21 or 22 for use in the manufacture of a medicament for the treatment or prevention of a disease or disorder.

25. The compound or composition of claim24, wherein the disease or disorder comprises cancer, an autoimmune disease, an inflammatory disease, or an infectious disease.